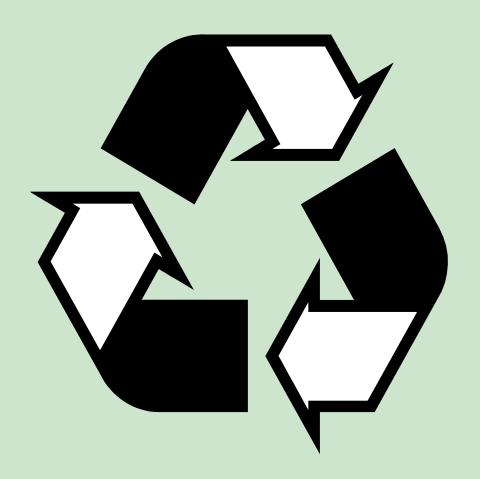
Minimizing Construction & Demolition Waste



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Solid Waste Management in Hawaii

Hawaii's primary way to manage solid waste has been disposal in landfills. With shortages of landfill sites and stricter federal government regulations (40 CFR 258 "Subtitle D") requiring a significant upgrade of waste disposal facilities, the State Legislature directed the Department of Health to evaluate solid waste management practices in Hawaii and develop a statewide plan. The result of the study was the

Solid Waste Management (ISWM) Plan.

The Plan is a comprehensive document focusing on reducing the generation of waste by moving away from conventional methods of waste disposal in landfills and incinerators. The three main waste reduction methods advocated in the Plan are source reduction, recycling and composting. The Plan called for statewide waste reduction goals of 25% by 1995, and 50% by year 2000. It was a guidance document which evaluated existing solid waste practices in the state and developed ways to move Hawaii toward sustainable waste management as a first priority and disposal as a final resort. It concluded that Hawaii had a need to plan for incineration with

energy recovery and landfilling, but that those efforts should not jeopardize current and future source reduction, recycling, and composting efforts.

Concurrent with the Plan, the legislature passed Act 324-91 which requires that the counties develop their own detailed ISWM Plans to insure the diversion of solid waste from landfills and incinerators. The State did achieve a waste diversion rate of 26.7% in 2001. We need a significant increase in recycling to meet the Environmental Protection Agency (EPA) goal of 35% goal by 2005. The EPA had a goal of 50% by the year 2000, but revised it to 35%

by the year 2005, finding

that states need a

more realistic time frame to reach higher total

waste reduction.

Construction & Demolition (C&D) material is targeted for landfill diversion the City & County

by of Honolulu

and the Neighbor Island counties because of the significant amount generated. Various county studies showed in 1995, over 30% of the waste generated (or 600,000 tons/year) was estimated to be C&D material.

Construction And Demolition Waste Management

Across the country, the volume of C&D waste is growing as older buildings are being demolished to make way for new ones. Over the last few years on Oahu, we've seen many major downtown and military structures torn down and replaced as we continue to increase urban densities. The majority of this material ends up in Oahu's landfills, but a significant amount is disposed of in a growing number of illegal dumps.

In Hawaii today, there is one privately owned C&D landfill at Nanakuli on the island of Oahu, and another on the island of Maui. The other major islands do not have C&D landfills. On these islands, C&D waste is being disposed at municipal solid waste (MSW) landfills. MSW landfills, in

contrast to C&D landfills, are more costly to construct and operate because they must comply with stringent federal regulations. Therefore, C&D waste that is disposed in MSW landfills consumes valuable disposal space.

As a result of the Integrated Solid Waste Management Plan, progress was made in implementing improved solid waste disposal methods which protect the environment. These improvements were necessary to comply with federal regulations imposed on the disposal facilities. If we are to become a sustainable society, Hawaii must work to divert waste from disposal. Let's examine some of the reasons for reducing our generation of C&D waste, and recycling what we generate.

Extending The Life Of Our Landfills

Landfill space in Hawaii is rapidly decreasing. As an island state, we have limited available land and no one wants a dump in their neighborhood. As previously mentioned, the State of Hawaii enacted legislation requiring that the counties develop policies aimed at reducing waste sent to landfills. To reach our goals, it is essential that the C&D waste stream is managed through source reduction, reuse, and recycling efforts. Fortunately, there can be considerable cost savings for construction

and demolition contractors who reduce or recycle those materials. These savings can increase as landfill capacity diminishes and disposal costs increase in coming years.

Unfortunately, as landfill costs increase, incidences of illegal dumping also rise. Illegal dumping sites with no health or environmental controls in place pose significant threats to public health and the environment. Establishing viable recycling options can help reduce the occurrence of illegal dumps.

Conserving Our Natural Resources

onstruction, demolition and land clearing materials can be recycled into a number of useful products.

Concrete and asphalt wastes can be crushed for use as aggregate base in road construction; metal can be sold as scrap to processors for recycling. Untreated wood and green wastes can be used as mulch or processed into compost;

new drywall scrap can used to amend organic compost; and corrugated cardboard can be recycled into new cardboard packaging. All of these recycling efforts help to conserve natural resources, one of the primary goals of resource recovery.

Reducing Waste Hauling And Disposal Costs

If your construction, demolition, and land clearing materials are currently being sent to a landfill, your disposal costs may be unnecessarily high. The tip fees at C&D landfills are considerably less than those of the MSW landfills.

Transport costs are also another concern among contractors. Transporting materials to recycling processors permitted by the Department of Health, Solid Waste Section (586-4226) are estimated to be around \$75 per hour. The listings in this guide show many recycling options for C&D wastes. Many are located much closer to populated areas than the MSW and C&D landfills. Depending on the size of your project, your company may be able to save money through reduced hauling and avoided disposal costs.

In addition, many contractors already receive revenues from the sale of pre-sorted materials such as scrap metal and cardboard. Contractors can arrange to have bins provided and have source separated C&D materials hauled from construction sites. There are also processing firms with on-site crushers for recycling and reuse of concrete and asphalt. This eliminates hauling and disposal fees, and the contractor can avoid purchasing structural fill or aggregate. Some waste haulers may offer special services, at reduced fees, for clean, partially separated construction materials.

This guide shows how to reduce the volume of C&D debris going into landfills. It also provides information on the reduction, reuse and recycling of construction and demolition materials at the source.

What Is Construction And Demolition Waste?

CONSTRUCTION AND DEMOLITION (C&D) waste is defined as solid, largely inert waste resulting from the construction, repair, demolition, or razing of buildings, roads and other structures. The term also includes debris from the clearing of land for construction.

This waste stream includes, but is not limited to: concrete, brick, asphalt, gypsum, wood waste, roofing and roofing paper, glass, ferrous and nonferrous metals, soil, trees, and shrubs.

REDUCE, REUSE, RECYCLE

Diverting waste from our disposal facilities involves finding ways to reduce, reuse and recycle. There are many advantages and benefits to waste reduction. We protect our environment and economic resources. We use less raw materials and thereby less energy to extract or harvest them from our natural environment. We

reduce the need for expensive and environmentally damaging disposal options and we create a market for waste materials to be used for recycling. The following discussion will provide an overview of some alternatives to disposal for C&D waste.

Waste Reduction

For a successful C&D waste reduction program, we need to educate the public, businesses, developers, contractors, and architects to use less and still achieve success. When designers and builders understand the negative impact that waste has on the environment, and the positive impact they can make in their efforts to reduce waste, they can be more proactive.

Architects must think ecologically about design and should design to use less. There are a number of ways architects may consider when specifying a product in the design of a project:

- Does the design or construction process reduce waste?
- Do the products specified include recycled content?
- Does the project use locally available and often overlooked resources?
- Are the products or materials specified easily recyclable?
- Can the products or materials specified be easily reused or salvaged?

For additional information, review "Residential Construction Waste Management, A Builders Field Guide" by the National Association of Home Builders; or contact the Clean Hawaii Center (587-3802) or the Office of Solid Waste Management (586-4226).

The Re-use Concept: Materials Exchanges

Some materials can be separated and reused in their existing form at the site, or later by other businesses and organizations. High value items such as doors, windows, fixtures and equipment may be accepted by local non-profit organization for self-help projects. In addition some contractors have found outlets for scrap plywood and drywall. For example, the Aloha Shares Network (866) 542-2232 (toll free) can list your unwanted items on its computerized data base. Also, some non-profit organizations and businesses take used paint for

community beautification. By participating in a materials exchange, a company can improve its bottom line by reduced hauling and disposal fees, receive a tax deduction and help the community. Using a materials exchange requires advance planning. While many local organizations may be able to reuse your unwanted materials, the timing of your project and collection or drop off requirements must be addressed in advance. See the reusable building materials section at the end of this guide.

Waste Recycling

How about recycling? Take scrap lumber, which due to its size or condition, cannot be reused, cut, press and glue it together into press board - you are recycling it. The wood fiber has gone through a remanufacturing process. Recycling requires energy and may have environmental implications when materials go through remanufacture. Therefore, reuse is generally preferred over recycling.

But recycling can provide significant benefits over making the product from virgin material. Today's waste entrepreneurs use heavy-duty, industrial materials. Current efforts in C&D waste reuse and recycling by Hawaii businesses include:

- Excavated Dirt: used for fill or topsoil.
- Excavated Rock: used for decorative walls or road base material.
- Non-Lead Based Painted Concrete: crushed and used for road base, backfill or sub-base for building construction.

- Asphalt concrete: crushed for use as aggregate, road base, or new asphalt concrete.
- Untreated Wood Waste: reused as pallets, or ground into mulch or biofuel.
- Green Waste: ground for use as mulch or for compost.
- Steel: processed for shipment to steel mills out of state.
- Cardboard: baled for shipment to paper mills out of state.

In addition, innovative local businesses are investigating applications for drywall in compost and soil amendment; asphalt shingles cold patch for road repair; and treated lumber as boiler fuel or for wallboard.

Managing C&D Waste: A Checklist

CONDUCT AN INFORMAL WASTE AUDIT

Determine the amounts, types, and time-frame for construction and demolition materials generated by your projects. Calculate any possible cost savings from reducing a portion of this waste, in terms of hauling and disposal cost avoidance.

REDUCE

Look at strategies to reduce construction and demolition waste volumes. Proper materials management practices may result in cost savings. Assure that precise estimates are made prior to purchase of materials, and that accurate measurements are made prior to cutting materials so that excess scrap and end cuts can be avoided.

Consider having materials pre-cut at lumber yards, using engineered wood products, steel framing, or other pre-manufactured components. Work with suppliers and subcontractors to minimize excess packaging and other non-essential material from being brought on site.

REUSE

Consider the potential for others to use the materials you normally discard. Consider planning ahead and calling Aloha Shares Network, Habitat for Humanity or other non-profit organizations to list such materials and/or arrange donations. This can provide your company with additional tax deductions. Conduct site pre-assessments for demolition projects to evaluate what materials can be salvaged for reuse, such as cabinets, architectural woodwork, light fixtures, and appliances.

RECYCLE

Investigate the companies listed in this guide that can recycle some of your construction and demolition waste from either source-separated or mixed loads. Compare the costs of recycling with the costs of disposal. Contact haulers. They may help you set up an effective separation program. Work with your subcontractors to keep recyclable scrap from being mixed with trash during clean-up.

EDUCATE EMPLOYEES, CONTRACTORS, AND SUBCONTRACTORS

Whatever waste reduction strategies you choose, it is crucial to educate and motivate employees and subcontractors for maximum participation. Emphasize that source reduction, reuse, and recycling is everybody's business.

Beginning a
Construction and
Demolition
Recycling
Program

The first step is to preassess the quantities and the composition of your waste; the time frame in which waste materials will be generated; and the amount of space available for separation of materials at the site.

Then with this information, you can begin to determine what wastes will be generated and if quantities will be significant enough to warrant source separation. Depending on the availability of storage and hauling, decisions can be made as to what materials to separate from the mixed wastes.

Of course, the more materials which are eliminated from the mixed wastes, the less material that must be hauled for disposal and the more money you can save.

C & D WASTE MANAGEMENT FACILITIES

STATEWIDE - FURNITURE, FIXTURES AND EQUIPMENT/REUSABLE BUILDING MATERIALS	9
OAHU1	0
Transfer Station1	0
Aggregate1	1
Ferrous Metals - Steel1	1
Non-ferrous Metals - Aluminum, Brass, Copper, and Stainless Steel1	1
Wood and Greenwaste 1	2
Cardboard1	2
Pallets1	3
APPLIANCES 1	3
OAHU C & D LANDFILL1	13
KAUAI 1	3
Maui	4
Hawaii1	15

STATEWIDE - REUSABLE BUILDING MATERIALS FURNITURE, FIXTURES AND EQUIPMENT

ALOHA SHARES NETWORK P.O. Box 880852 (866 Pukalani, HI 96788 (mailing address) www.alohashares.org	5) 542-2232 (toll free) 572-6668 (Maui) 572-4817 (fax)	Services: A computerized materials exchange of new, used and recyclable building materials. List and request your materials online.
ANGEL NETWORK CHARITIES 5339 Kalanianaole Highway Honolulu, HI 96821	377-1841 377-9790 (fax)	Services: Accepts donations of appliances, furniture and household items which they donate to homeless families or for resale to the public
APPLIANCE REBUILDERS, INC. 150 Hamakua Drive, Suite 4125 Kailua, HI 96734	845-1388 847-6087 (fax)	Services: Accepts and rebuilds used home appliances; will remove and haul appliances in bulk
BASEYARD HAWAII 50 Sand Island Access Rd. Honolulu, HI 96819 (Past La Mariana Restaurant, to rig	842-0770 842-0780 (fax) ht of Honolulu Recovery)	Services: Accepts and restores new and used reusable construction goods

GOODWILL INDUSTRIES 2610 Kilihau Street Honolulu, HI 96819 www.higoodwill.org	836-0313 833-4943 (fax) 961-0307 (Hilo)	Services: Accepts donations of small appliances and other household items
HABITAT FOR HUMANITY 2728 Huapala Street Honolulu, HI 96822 www.honoluluhabitat.org	988-9339 988-2498 (fax) 935-6677 (Hilo) 245-1996 (Kauai) 893-0334 (Kahului)	Services: Accepts donations of building materials for use in self-help housing projects
REBUILDING TOGETHER HAWAII (FORMERLY CHRISTMAS IN APRI www.rebuildingtogether.org		Services: Accepts donations of building materials for use in annual community service housing rehab projects for the needy
PROJECT RENEWAL 1374 Nuuanu Avenue Honolulu, HI 96817	531-7795 531-7795 (fax)	Services: Accepts donations and will remove and pick up used building material and other household and commercial items
SALVATION ARMY 322 Sumner Street Honolulu, HI 96817 www.salvationarmyhawaii.org	522-8411 522-8492 (fax) 935-5531 (Hilo) 877-3074 (Kahului) 326-2330 (Kona) 245-2571 (Lihue)	Services: Accepts donations for resale of furniture and small appliances; call for pickup of larger items
OAHU - TRANSFER STATION		
ISLAND DEMO, INC. 2769 Kilihau Street Honolulu, HI 96819	839-5522 839-5515 (fax)	Services: Accepts and sorts construction and demolition debris

OAHU - AGGREGATE

GRACE PACIFIC CORPORATION Makakilo Upper Quarry	672-3545 672-3998 (fax)	Services: Accepts and crushes uncontaminated reinforced concrete from their jobs into base course material
R.H.S. LEE, INC. Royal Kunia (On mauka end of Anonui St.)	455-9026 455-3850 (fax)	Services: Accepts and crushes uncontaminated reinforced concrete from their jobs into fill
SPHERE, LLC DBA PACIFIC AGGR 87-601 Pa'akea Road Waianae, HI 96792	REGATE 682-2047 682-5087 (fax)	Services: Accepts and crushes uncontaminated reinforced concrete from their jobs into fill

OAHU - FERROUS METALS - STEEL

C.M. RECYCLING, LLC 204 Sand Island Access Road Honolulu, HI 96819	842-6640 842-6733 (fax)	Services: Accepts, buys back and processes ferrous metal
HAWAII METAL RECYCLING CO. 91-056 Hanua Street Campbell Industrial Park Kapolei, HI 96707	682-5810 682-0604 (fax)	Services: Accepts, buys back and processes ferrous metal

OAHU - NON-FERROUS METALS - ALUMINUM, BRASS, COPPER, AND STAINLESS STEEL

C.M. RECYCLING, LLC 204 Sand Island Access Road Honolulu, HI 96819	842-6640 842-6733 (fax)	Services: Accepts, buys back and processes non-ferrous metal
HANS METALS INC. 94-170 Leokane Street Waipahu, HI 96797	676-4797 671-0729 (fax)	Services: Accepts and buys back non-ferrous metal
ISLAND RECYCLING, INC.		Services:
50 Sand Island Access Road Honolulu, HI 96819	845-1188 842-0907 (fax)	Accepts and buys back aluminum and non-ferrous metal

OKUDA METALS, INC. 1804 Kahai Street Honolulu, HI 96819	845-6856 842-0249 (fax)	Services: Accepts and buys back aluminum and non-ferrous metal
REYNOLDS RECYCLING, INC. 99-1160 Iwaena St. Aiea, HI 96701-3258 www.reynoldsrecycling.com	487-2802 486-7753 (fax)	Services: Accepts and buys back aluminum and non-ferrous metal

OAHU - WOOD AND GREENWASTE

C. BARTON POTTER CO.		Services:
3115 La'i Road	735-1463	Accepts high quality logs, milling
Honolulu, HI 96816	735-1463 (fax)	them into lumber for various commercial uses
HAWAIIAN EARTH PRODUCTS, I	LTD.	Services:
91-400 Malakole Rd.	682-5895	Accepts clean green waste for
Kapolei, HI 96707	682-0762 (fax)	processing into "Menehune Magic"
	261-5877	organic soil amendments
197 Kalanianaole Highway – Ka www.menehunemagichawaii.com	- · ·	
LAIE TREATMENT WORKS		Services:
LAIE TREATMENT WORKS 55-510 Kamehameha Highway Kapolei, HI 96707	293-9201	Services: Accepts clean green waste for processing

OAHU - CARDBOARD

HONOLULU RECOVERY SYSTEMS		Services:
P.O. Box 6356	842-3602	Accepts, picks up and processes
Honolulu, HI 96819-6356	841-2438 (fax)	cardboard
In the Description of Inc		g ·
ISLAND RECYCLING, INC.		Services:
50 Sand Island Access Road	845-1188	Accepts, picks up and processes

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OAHU - PALLETS		
HAWAIIAN EARTH PRODUCTS 91-400 Malakole Rd. Kapolei, HI 96707	682-5895 682-0762 (fax) 261-5877	Services: Accepts uncontaminated, untreated used wooden pallets and uncontaminated, untreated wood
197 Kalanianaole Highway – Kapaa www.menehunemagichawaii.com	a Quarry Road	
Island Recycling, Inc. 50 Sand Island Access Road Honolulu, HI 96819	845-1188 842-0907 (fax)	Services: Accepts and fixes used pallets
OAHU - APPLIANCES		
HAWAII METAL RECYCLING Co. 91-056 Hanua Street Campbell Industrial Park Kapolei, HI 96707	682-5810 682-0604 (fax)	Services: Accepts/buys back and processes white goods and ferrous metals (Freon/CFCs and used oil must be removed)
REFRIGERANT RECYCLING, INC. 91-120 Hanua Street Campbell Industrial Park Kapolei, HI 96707	682-1555 682-1904 (fax)	Services: Accepts and processes white goods. Removes Freon/CFCs and used oil
OAHU - C & D LANDFILL		
PVT LAND COMPANY 87-2020 Farrington Highway Waianae, HI 96792	668-4561 668-1368 (fax)	Services: Accepts and landfills construction and demolition site materials, including: concrete, hollow bituminous concrete, asphalt pavement, wood, glass masonry, flooring, siding plaster, dirt, rock, stumps, boulders and brush
Kauai		
GARDEN ISLE DISPOSAL 2666 Niumalu Road Lihue, HI 96766	245-2372 245-2435 (fax)	Services: Accepts cardboard
KAUAI NURSERY & LANDSCAPING 3-1550 Kaumualii Highway Lihue, HI 96766	245-7747 245-9289 (fax)	Services: Accepts green waste

KAUAI RESOURCE CENTER 3460 Ahukini Road Lihue, HI 96766	245-4700	Services: Accepts cardboard, tires, untreated pallets and non-ferrous scrap
PUHI METALS RECYCLING At the junction of Puhi and Hulemalu Rd.	241-6880	Services: Accepts and processes scrap metal and white goods. Removes Freon/CFCs and used oil
REYNOLDS RECYCLING Along Kanoa St. near Hale Kauai, Nawiliwili Harbor	245-7233	Services: Accepts non-ferrous scrap
WAIPA FOUNDATION One mile past Hanalei	826-4581	Services: Accepts green waste
KEKAHA LANDFILL Along Kaumualii Highway in Kekaha	337-9213	Services: Accepts and landfills construction and demolition site materials, including: concrete, hollow bituminous concrete, asphalt pavement, wood, glass masonry, flooring, siding plaster, dirt, rock, stumps, boulders and brush
M AUI		
HAWAII TIRE DISPOSING Co., LLC 2000 Mokulele Highway Wailuku, HI 96793	873-0274 873-8045 (fax)	Services: Accepts motor vehicle tires
MAUI WASTE. FORMERLY MAUI DISPOSAL COMPANY, INC.		Services:
2000 Mokulele Highway Wailuku, HI 96793 www.horizon-hawaii.com	242-7999	Accepts, picks-up and processes cardboard
MAUI EARTH COMPOSTING At corner of Hanson Rd. and Pulehu Rd.	877-0403	Services: Accepts and processes green waste

MAUI EKO SYSTEMS Next to the Central Maui Landfill, Phase 3	572-8844 877-7589 (fax)	Services: Accepts and processes green waste and uncontaminated, untreated lumber
REYNOLDS RECYCLING 261 Dairy Road Kahului, HI 96732	487-2802	Services: Accepts non-ferrous scrap
DE COITE C & D LANDFILL At corner of Pi'ilani Highway and Honoapi'ilani Highway	871-7496 877-6412 (fax)	Services: Accepts and landfills construction and demolition site materials, including: concrete, hollow bituminous concrete, asphalt pavement, wood, glass masonry, flooring, siding plaster, dirt, rock, stumps, boulders and brush
Hawaii		
ATLAS RECYCLING 30 Makaala Street Hilo, HI 96720 74-5599 Pawai Place Kailua-Kona, HI 96740	935-9328 329-6868	Services: Accepts cardboard, pallets and non-ferrous metals; operates drop-off locations in select areas
BIG ISLAND SCRAP METAL At Hilo Transfer Station Leilani St. past Railroad Ave. At Kailua Transfer Station Old Kona Landfill at Kealakehe	961-8942	Services: Accepts and processes white goods and scrap metal. Removes Freon/CFCs and used oil
BIG ISLAND RECYCLING CO. At Hilo Transfer Station Leilani St. past Railroad Ave. At Kailua Transfer Station	961-8942	Services: Accepts green waste for processing into mulch
At Old Kona Landfill at Kealakehe DANIEL BOLTON At Hualalai Road, Kailua-Kona	329-8240	Services: Accepts green waste

WEST HAWAII LANDFILL Near corner of Queen Kaahumanu Highway and Pu'u Pohaka Rd.	886-8059	Services: Accepts and landfills construction and demolition site materials, including: concrete, hollow bituminous concrete, asphalt pavement, wood, glass masonry, flooring, siding plaster, dirt, rock, stumps, boulders and brush
HILO LANDFILL Along Railroad Ave. in Hilo	961-8635	Services: Accepts and landfills construction and demolition site materials, including: concrete, hollow bituminous concrete, asphalt pavement, wood, glass masonry, flooring, siding plaster, dirt, rock, stumps, boulders and brush

For further information on construction and demolition recycling, please contact:

Department of Health Office of Solid Waste Management www.state.hi.us/health/eh/shwb/sw 586-4226